

## GLACE: A TECHNOLOGY DEMONSTRATION EXPERIMENT FOR LASER COOLED ATOMIC CLOCKS IN SPACE

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We have been developing a laser-cooling apparatus for flight on the International Space Station (ISS), with the intention of demonstrating linewidths on the cesium clock transition narrower than can be realized on the ground. GLACE (the Glovebox Laser-cooled Atomic Clock Experiment) is scheduled for launch on Utilization Flight 3 (UF3) in 2002, and will be mounted in one of the ISS Glovebox platforms for an anticipated 2-3 week run. Separate flight definition projects funded at NIST and Yale by the Microgravity Research Division of NASA as a part of its Laser Cooling and Atomic Physics (LCAP) program will follow GLACE. Core technologies for these and other LCAP missions are being developed at JPL, with the current emphasis on developing components such as the laser and optics subsystem, and non-magnetic vacuum-compatible mechanical shutters. Significant technical challenges in developing a space qualifiable laser cooling apparatus include reducing the volume, mass, and power requirements, while increasing the ruggedness and reliability in order to both withstand typical launch conditions and achieve several months of unattended operation. This work was performed at the Jet Propulsion Laboratory under a contract with the National Aeronautics and Space Administration.

Prefer oral session

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